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Jim H. Salter
Blakely, Sokoloff, Taylor and Zafman LLP
1279 Oakmead Parkway
Sunnyvale, CA 94085

EXAMINER	
TORRES, JUAN A	

ART UNIT	PAPER NUMBER
2631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/072,091	NORRELL ET AL.	
	Examiner	Art Unit	
	Juan A. Torres	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 September 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-29-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed on 09/14/2005 have been fully considered but they are not persuasive.

Regarding Drawing Objections:

The Applicant contends, "Figure 1 has been objected to because it does not include a designation as Prior Art. Figure 1 illustrates a graphical example of attenuation. Applicant has not admitted that Figure 1 is prior ad and the content of Figure 1 does not necessarily meet the guidelines under 35 U.S.C. ïj 102, 103 to qualify as prior art. Therefore, Applicant respectfully requests that the objection to Figure 1 be withdrawn.

The Examiner disagrees and asserts, that, as indicated in the previous Office action because only that which is old is illustrated, Figure 1 should be designated by a legend such as --Prior Art—(see MPEP § 608.02(g)).

Regarding Claims 1-17:

The Applicant contends, "Shenoi fails to disclose every element of the claim. In particular, Shenoi fails to disclose a loop extender with diagnostic functionality."

The Examiner disagrees and asserts, that, as indicated in the previous Office action Shenoi discloses a system for improving transmission of DSL signals over a local loop, the system comprising a loop extender with communications, control, and diagnostic functionality and a central office controller coupled to the loop extender via the local loop for controlling the loop extender.

Shenoi discloses that "Referring to FIG. 4, an outline of the functional blocks in an ADSL repeater 400 are depicted. For convenience certain functions such as power and control are not shown in FIG. 4. Power and control units can be coupled to the ADSL repeater 400" (column 7 line 54-63); "For test and maintenance purposes, the central office end needs to be capable of forcing any one chosen repeater (on the subscriber loop under test) to enter a loop-back state. That is, a test signal sent from the central office is "looped back" at the chosen repeater and the condition of the loop up to that chosen repeater can be validated" (column 9 lines 11-18); "Each 25-pair "repeater housing" can include one controller (microprocessor) and modems that convert the digital control information to (and from) analog for transport over the control pair. These controllers can operate in a "daisy chain" which allows the central office end to query for status, or control the operation of, any repeater housing in the path. For long loops, those exceeding 18 thousand feet, there may be as many as 4 or 5 (or more) repeater housings connected in series (approximately 6000 feet apart). The control information will include commands for maintenance and provisioning information" (column 8 lines 57-67); "The basic circuit outline 500 of the Extender unit is shown in FIG. 5" (column 9 line 46). For these reasons and the reasons indicated in the previous Office action, the rejections of claims 1-17 are maintained.

Regarding Claims 18-31:

The Applicant contends, "Shenoi fails to disclose configuring a loop extender with diagnostic functionality"

The Examiner disagrees and asserts, that, as indicated in the previous Office action Shenoi discloses, "Referring to FIG. 4, an outline of the functional blocks in an ADSL repeater 400 are depicted. For convenience certain functions such as power and control are not shown in FIG. 4. Power and control units can be coupled to the ADSL repeater 400" (column 7 line 54-63); "For test and maintenance purposes, the central office end needs to be capable of forcing any one chosen repeater (on the subscriber loop under test) to enter a loop-back state. That is, a test signal sent from the central office is "looped back" at the chosen repeater and the condition of the loop up to that chosen repeater can be validated" (column 9 lines 11-18); "Each 25-pair "repeater housing" can include one controller (microprocessor) and modems that convert the digital control information to (and from) analog for transport over the control pair. These controllers can operate in a "daisy chain" which allows the central office end to query for status, or control the operation of, any repeater housing in the path. For long loops, those exceeding 18 thousand feet, there may be as many as 4 or 5 (or more) repeater housings connected in series (approximately 6000 feet apart). The control information will include commands for maintenance and provisioning information" (column 8 lines 57-67); "The basic circuit outline 500 of the Extender unit is shown in FIG. 5" (column 9 line 46). For these reasons and the reasons indicated in the previous Office action, the rejections of claims 18-31 are maintained.

Regarding Claims 32-41:

The Applicant contends, "Shenoi fails to disclose capacitive coupling, an analog multiplexer/analog-to-digital converter (AMADC), and a diagnostic/control processor (DCP)"

The Examiner assert that Shenoi discloses, AMADC: "Each 25-pair "repeater housing" can include one controller (microprocessor) and modems that convert the digital control information to (and from) analog for transport over the control pair. These controllers can operate in a "daisy chain" which allows the central office end to query for status, or control the operation of, any repeater housing in the path. For long loops, those exceeding 18 thousand feet, there may be as many as 4 or 5 (or more) repeater housings connected in series (approximately 6000 feet apart). The control information will include commands for maintenance and provisioning information" (column 8 lines 57-67).

Shenoi also discloses a diagnostic/control processor (DCP) "For test and maintenance purposes, the central office end needs to be capable of forcing any one chosen repeater (on the subscriber loop under test) to enter a loop-back state. That is, a test signal sent from the central office is "looped back" at the chosen repeater and the condition of the loop up to that chosen repeater can be validated" (column 9 lines 11-18).

Shenoi also discloses bypass switches in the coils and in the extender: "The provisioning information relates to the mode of operation of each of the 20 pair of cable that carry ADSL. One mode is "normal", where the repeater is operating and the load

coils are in the circuit. Another mode is "no-ADSL-repeater" wherein the repeaters are not part of the circuit. This latter mode has two "sub-modes". The load-coils may be in the circuit or be removed. The last sub-mode is appropriate if the loop is actually short and we do not need the repeaters and the load coils need to be removed. Of course, other modes of operation can be conceived of" (column 9 lines 1-10).

The Examiner agrees that Shenoi doesn't disclose "capacitive coupling" and for this reason withdrawn the 102 rejections of claims 32-41 of the previous Office action.

Regarding Claims 42-48:

The Applicant contends, "Shenoi fails to disclose sampling DSL signals within the amplification circuitry and processing the sampled DSL signals to evaluate amplification circuitry performance"

The Examiner disagrees and asserts, that, as indicated in the previous Office action Shenoi discloses, "Each 25-pair "repeater housing" can include one controller (microprocessor) and modems that **convert the digital control information to (and from) analog** for transport over the control pair. These controllers can operate in a "daisy chain" which **allows the central office end to query for status, or control the operation of, any repeater** housing in the path. For long loops, those exceeding 18 thousand feet, there may be as many as 4 or 5 (or more) repeater housings connected in series (approximately 6000 feet apart). The control information will include commands for maintenance and provisioning information" (column 8 lines 57-67). For these reasons and the reasons indicated in the previous Office action, the rejections of claims 42-48 are maintained.

Regarding Claim 49:

The Applicant contends, "Shenoi fails to disclose means for sampling DSL signals within the amplification circuitry and means for processing the sampled DSL signals to evaluate amplification circuitry performance."

The Examiner disagrees and asserts, that, as indicated in the previous Office action Shenoi discloses, "Each 25-pair "repeater housing" can include one controller (microprocessor) and modems that **convert the digital control information to (and from) analog** for transport over the control pair. These controllers can operate in a "daisy chain" which **allows the central office end to query for status, or control the operation of, any repeater** housing in the path. For long loops, those exceeding 18 thousand feet, there may be as many as 4 or 5 (or more) repeater housings connected in series (approximately 6000 feet apart). The control information will include commands for maintenance and provisioning information" (column 8 lines 57-67). For these reasons and the reasons indicated in the previous Office action, the rejection of claim 49 is maintained.

Information Disclosure Statement

The information disclosure statement filed 08/29/2005 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because a concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language has not been provided for the first reference of the Non Patent Literature Documents. It has been placed in the application

file, but the information referred to therein for the first reference of the Non Patent Literature has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- **because only that which is old is illustrated**. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The modifications to the specification were received on 09/14/2005. These modifications are accepted by the Examiner.

Claim Objections

In view of the Arguments received on 09/14/2005, the Examiner withdrawn claim objection of the previous Office Action.

Double Patenting

In view of the Arguments received on 09/14/2005, the Examiner withdrawn double patenting rejection of the previous Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-31 and 42-49 are rejected under 35 U.S.C. 102(e) as being anticipated by Shenoi (US 6507606).

As per claim 1 Shenoi discloses a system for improving transmission of DSL signals over a local loop, the system comprising a loop extender with communications, control, and diagnostic functionality (figure 5 column 7 line 54 to column 10 line 22); and a central office controller coupled to the loop extender via the local loop for controlling the loop extender (column 7 line 54 to column 10 line 22).

As per claim 2 Shenoi discloses that wherein the central office controller includes a modem for communication with the loop extender; a processor coupled to the modem; and loop extender management software executable by the processor (column 7 line 54 to column 10 line 22).

As per claim 3 Shenoi discloses that the modem communicates in a voice-frequency band (column 1 lines 48-60).

As per claim 4 Shenoi discloses that the processor generates control signals (column 7 line 54 to column 10 line 22; and column 17 line 61 to column 18 line 3).

As per claim 5 Shenoi discloses inherently that the central office controller transmits the control signals to the loop extender via the local loop when POTS signals are not present on the local loop (column 1 lines 48-60 and column 1 line 61 to column 2 line 11). It is very well known, even to a person of non-ordinary skill in the art, that when a voice modem such as the disclosed in column 1 lines 48-60 is in operation, the PTOS signal can no be presents.

As per claim 6 Shenoi discloses an ATU-C coupled to the local loop configured to receive and transmit DSL signals (figure 1 column 5 line 49 to column 6 line 34); and a DSLAM controller coupled to the processor and the ATU-C configured to control access to the local loop (figure 1 column 5 line 49 to column 6 line 2).

As per claim 7 Shenoi discloses that the processor receives local loop information from the DSLAM controller (column 8 lines 57-67).

As per claim 8 Shenoi discloses that the processor sends instructions to the DSLAM controller for operating the ATU-C (column 8 lines 57-67).

As per claim 9 Shenoi discloses the loop extender includes a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop (figure 4 column 7 line 64 to column 8 line 14); a diagnostic/control unit coupled to the local loop for providing communications, control,

and diagnostic functionality (column 7 line 54-63 and column 8 lines 57-67); and amplification circuitry capacitive coupled to the local loop via bypass switches for providing DSL signal amplification (figure 4 column 7 line 64 to column 8 line 14).

As per claim 10 Shenoi discloses that the diagnostic/control unit includes a modem coupled to the local loop for communication with the central office controller (column 8 lines 57-67); an analog multiplexer/analog-to-digital converter (AMADC) coupled to the amplification circuitry for sampling DSL signal data via diagnostic lines (column 8 lines 57-67); and a diagnostic/control processor (DCP) coupled to the modem and the AMADC for processing the control signals received via the modem and analyzing the sampled DSL signal data from the AMADC (column 8 lines 57-67).

As per claim 11 Shenoi inherently discloses that the DCP processes the sampled DSL signal data to compute average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control).

As per claim 12 Shenoi inherently discloses that the DCP processes the sampled DSL signal data to compute peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the peak power is inherently in the calculation of the spectral density and power control).

As per claim 13 Shenoi inherently discloses the DCP processes the sampled DSL signal data to compute root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control).

As per claim 14 Shenoi discloses the DCP processes the sampled DSL signal data to compute power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60).

As per claim 15 Shenoi inherently discloses a bypass relay for coupling the DCP to the bypass switches (column 8 line 57 to column 9 line 35).

As per claim 16 Shenoi inherently discloses the DCP upon receiving control signals from the central office controller, uncouples the amplification circuitry from the local loop by activating a deactivated bypass relay (column 8 line 57 to column 9 line 35).

As per claim 17 Shenoi inherently discloses the DCP upon receiving control signals from the central office controller, couples the amplification circuitry to the local loop by deactivating an activated bypass relay (column 8 line 57 to column 9 line 35).

As per claim 18 Shenoi discloses a method for improving transmission of DSL signals over a local loop, comprising the steps of configuring a loop extender with communications, control, and diagnostic functionality (figure 5 column 7 line 54 to column 10 line 22); and controlling the loop extender with a central office controller coupled to the loop extender via the local loop (column 7 line 54 to column 10 line 22).

As per claim 19 Shenoi discloses that the step of controlling the loop extender includes the steps of generating control signals via a processor (column 8 lines 57-67 and column 17 line 61 to column 18 line 3); and transmitting the control signals to the loop extender via the local loop when POTS signals are not present on the local loop (column 1 lines 48-60 and column 1 line 61 to column 2 line 11). It is very well known,

even to a person of non-ordinary skill in the art, that when a voice modem such as the disclosed in column 1 lines 48-60 is in operation, the PTOS signal can no be presents.

As per claim 20 Shenoi discloses the control signals are transmitted in a voice-frequency band (column 1 lines 48-60).

As per claim 21 Shenoi discloses receiving and transmitting DSL signals via an ATU-C coupled to the local loop (figure 1 column 5 line 49 to column 6 line 34); and controlling access to the local loop via a DSLAM controller coupled to the processor and the ATU-C (figure 1 column 5 line 49 to column 6 line 2).

As per claim 22 Shenoi discloses that the processor receives local loop information from the DSLAM controller (column 8 lines 57-67).

As per claim 23 Shenoi discloses that the processor sends instructions to the DSLAM controller for operating the ATU-C (column 8 lines 57-67).

As per claim 24 Shenoi discloses improving transmission of POTS band signals over the local loop via a POTS loading coil coupled to the local loop (figure 4 column 7 line 64 to column 8 line 14); providing communications, control, and diagnostic functionality via a diagnostic/control unit coupled to the local loop (column 7 line 54-63 and column 8 lines 57-67); and providing DSL signal amplification via amplification circuitry capacitive coupled to the local loop via bypass switches (figure 4 column 7 line 64 to column 8 line 14).

As per claim 25 Shenoi discloses that providing communications, control, and diagnostic functionality includes the steps of receiving the control signals from the central office controller (column 8 lines 57-67); processing the received control signals

(column 8 lines 57-67); sampling DSL signal data in accordance with the processed control signals (column 8 lines 57-67); and processing the sampled DSL signal data (column 8 lines 57-67).

As per claim 26 Shenoi discloses that the step of processing the sampled DSL signal data includes computing average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control).

As per claim 27 Shenoi discloses that the step of processing the sampled DSL signal data includes computing peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the peak power is inherently in the calculation of the spectral density and power control).

As per claim 28 Shenoi discloses that the step of processing the sampled DSL signal data includes computing root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control).

As per claim 29 Shenoi discloses that the step of processing the sampled DSL signal data includes computing power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60).

As per claim 30 Shenoi discloses that the amplification circuitry is uncoupled from the local loop in accordance with the processed control signals (column 8 line 57 to column 9 line 35).

As per claim 31 Shenoi discloses that the amplification circuitry is coupled to the local loop in accordance with the processed control signals (column 8 line 57 to column 9 line 35).

As per claim 42 Shenoi discloses a method for improving transmission of DSL signals over a local loop, the method comprising the steps of generating control signals in a central office (column 7 line 54 to column 10 line 22; and column 17 line 61 to column 18 line 3); transmitting the control signals and DSL signals over the local loop (column 1 lines 48-60 and column 1 line 61 to column 2 line 11); providing DSL signal amplification via amplification circuitry coupled to the local loop (figure 4 column 7 line 64 to column 8 line 14); sampling DSL signals within the amplification circuitry in accordance with the control signals received by a diagnostic/control unit coupled to the amplification circuitry (column 8 lines 57-67); and processing the sampled DSL signals to evaluate amplification circuitry performance (column 8 lines 57-67).

As per claim 43 Shenoi discloses that the step of processing the sampled DSL signal data includes computing average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control).

As per claim 44 Shenoi discloses that the step of processing the sampled DSL signal data includes computing peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the peak power is inherently in the calculation of the spectral density and power control).

As per claim 45 Shenoi discloses that the step of processing the sampled DSL signal data includes computing root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control).

As per claim 46 Shenoi discloses that the step of processing the sampled DSL signal data includes computing power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60).

As per claim 47 Shenoi discloses that the method further includes the step of uncoupling the amplification circuitry from the local loop in accordance with control signals received by the diagnostic/control unit (column 8 line 57 to column 9 line 35).

As per claim 48 Shenoi discloses that the method further includes the step of coupling the amplification circuitry to the local loop in accordance with control signals received by the diagnostic/control unit (column 8 line 57 to column 9 line 35).

As per claim 49 Shenoi discloses a system for improving transmission of DSL signals, the system comprising means for generating control signals (column 8 lines 57-67 and column 17 line 61 to column 18 line 3); means for transmitting the control signals and DSL signals (column 1 lines 48-60 and column 1 line 61 to column 2 line 11); means for amplifying the DSL signals (figure 4 column 7 line 64 to column 8 line 14); means for processing the control signals (column 8 lines 57-67); means for sampling the DSL signals in accordance with the processed control signals(column 8 lines 57-67); and means for processing the sampled DSL signals to evaluate the means for amplifying (column 8 lines 57-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 32-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shenoi (US 6507606) in view of Mukherjee (US 6226322 B1).

As per claim 32 Shenoi discloses a system for improving transmission of DSL signals over a local loop, the system comprising: a central office controller, the central office controller including, a first modem coupled to the local loop, a processor coupled to the first modem, loop extender management software executable by the processor for generating control signals, an ATU-C coupled to the local loop configured to receive and transmit DSL signals, and a DSLAM controller coupled to the processor and the ATU-C configured to control access to the local loop (column 7 line 54-63 and column 8 lines 57-67); and a loop extender coupled to the central office controller via the local loop, the loop extender including, a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop, amplification circuitry coupled to the local loop via bypass switches for providing DSL signal amplification (column 9 lines 1-10; figures 4-5 column 7 line 54 to column 10 line 22), a second modem coupled to the local loop for receiving the control signals, an AMADC coupled to the amplification circuitry for sampling DSL signal data via diagnostic lines (column 8 lines 57-67), and a DCP (column 9 lines 11-18) coupled to

the second modem and the AMADC for processing the control signals received via the second modem and analyzing the sampled DSL signal data from the AMADC (figure 5 column 9 line 46 to column 10 line 22). Shenoi doesn't disclose that the amplification circuit is capacitively couple. Mukherjee discloses an amplification circuit is capacitively couple (figures 7-8 block 89 column 17 line 28 to column18 line 34). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 32.

As per claim 33 Shenoi discloses that the first modem and second modem communicate in a voice-frequency band (column 1 lines 48-60). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 33.

As per claim 34 Shenoi discloses that the central office controller transmits the control signals to the loop extender via the local loop when POTS signals are not present on the local loop (column 1 lines 48-60 and column 1 line 61 to column 2 line 11). It is very well known, even to a person of non-ordinary skill in the art, that when a voice modem such as the disclosed in column 1 lines 48-60 is in operation, the PTOS signal can no be presents. Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 34.

As per claim 35 Shenoi discloses that the DCP processes the sampled DSL signal data to compute average power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the average power is inherently in the calculation of the spectral density and power control). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17

lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 35.

As per claim 36 Shenoi discloses that the DCP processes the sampled DSL signal data to compute peak power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the peak power is inherently in the calculation of the spectral density and power control). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 36.

As per claim 37 Shenoi discloses that the DCP processes the sampled DSL signal data to compute root-mean-square power (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60. The calculation of the root-mean-square (rms) power is inherently in the calculation of the spectral density and power control). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier

(Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 37.

As per claim 38 Shenoi discloses that the DCP processes the sampled DSL signal data to compute power spectral density (figures 12 and 13, column 8 lines 57-67 and column 17 lines 46 to 60). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 38.

As per claim 39 Shenoi inherently discloses a bypass relay for coupling the DCP to the bypass switches (column 8 line 57 to column 9 line 35). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 39.

As per claim 40 Shenoi discloses that the DCP upon receiving control signals from the central office controller, uncouples the amplification circuitry from the local loop by activating a deactivated bypass relay (column 8 line 57 to column 9 line 35). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 40.

As per claim 41 Shenoi discloses the DCP upon receiving control signals from the central office controller, couples the amplification circuitry to the local loop by deactivating an activated bypass relay (column 8 line 57 to column 9 line 35). Shenoi and Mukherjee teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the capacitor disclosed by Mukherjee with the loop extender disclosed by Shenoi. The suggestion/motivation for doing so would have been to reject the low frequency signals and improve the performance of the amplifier (Mukherjee column 17 lines 28-41). Therefore, it would have been obvious to combine Mukherjee with Shenoi to obtain the invention as specified in claim 41.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Juan Alberto Torres
09-29-2005

KEVIN BUR
PRIMARY EXAMIN